



Docket No.: SON-3162
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Toshihiko Shirasagi, et al.

Application No.: 10/579,211

Confirmation No.: 6592

Filed: May 12, 2006

Art Unit: 1795

For: MANUFACTURING METHOD OF MASTER
DISC FOR OPTICAL DISC, AND MASTER
DISC FOR OPTICAL DISC

Examiner: A. L. Verderame

APPELLANT'S BRIEF

MS Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

INTRODUCTORY COMMENTS

This is an Appeal Brief under 37 C.F.R. §41.37 appealing the final decision of the Examiner dated November 4, 2009.

Each of the topics required by 37 C.F.R. §41.37 is presented herewith and is labeled appropriately.

This brief is in furtherance of the Final Office Action on November 4, 2009.

A Final Office Action dated February 18, 2009 was mailed in the present application.

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In response to the Final Office Action of February 18, 2009, a Notice of Appeal was filed in this case on June 18, 2009, along with a Request for Panel Review (“the First Request”).

The Notice of Panel Decision From Pre-Appeal Brief Review dated October 30, 2009 (“the First Decision”) withdrew the Final Office Action of February 18, 2009.

Another Final Office Action dated November 4, 2009 was mailed in the present application.

In response to the Final Office Action of November 4, 2009, a Notice of Appeal was filed in this case on April 6, 2010, along with a Request for Panel Review (“the Second Request”).

The Notice of Panel Decision From Pre-Appeal Brief Review dated May 7, 2010 (“the Second Decision”) contends in item 1 that the arguments presented in the response do not correspond to the pending claims and that the Request for Panel Review is improper as a result.

Thus, the filing of this Appellant’s Brief is timely. 37 C.F.R. §1.136.

I. REAL PARTY IN INTEREST

Sony Corporation of Tokyo, Japan ("Sony") is the real party in interest of the present application. An assignment of all rights in the present application to Sony was executed by the inventor and recorded by the U.S. Patent and Trademark Office at **Reel 017911, Frame 0780**.

II. RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences that will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

Within the Final Office Action of November 4, 2009:

The status of the claims is as follows:

Claim 1	Rejected
Claims 2-3	Canceled
Claim 4-7	Rejected
Claims 8-9	Canceled
Claim 10	Rejected

No claims are indicated within the Final Office Action to contain allowable subject matter.

Accordingly, Appellant hereby appeals the final rejection of claims 1, 4-7, and 10 which are presented in the Claims Appendix.

IV. STATUS OF AMENDMENTS

Provided is a statement of the status of any amendment filed subsequent to final rejection.

Subsequent to the final rejection of November 4, 2009, a Response to Final Action has been filed in this case on February 1, 2010.

The Advisory Action dated March 9, 2010 indicates that the Response of February 1, 2010 would not be entered.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The following description is provided for illustrative purposes and is not intended to limit the scope of the invention.

Claim 1 is drawn to a manufacturing method of a master disc for an optical disc, comprising:	
a film forming step of forming an inorganic resist layer (2) made of an incomplete oxide of a transition metal as a film onto a substrate (1) {Figure 1A}; and	Paragraph beginning at page 10, line 14
a step of forming resist patterns including concave/convex shapes by exposing and developing said inorganic resist layer (2) {Figures 1B, 1C},	Page 10, line 27 through page 11, line 22
wherein in said film forming step, oxygen concentration of said inorganic resist layer (2) is made different in its thickness direction,	Paragraph beginning at page 12, line 20
wherein said oxygen concentration is increased toward the surface of said substrate (1) from the surface of said inorganic resist layer (2).	Paragraph beginning at page 14, line 25

Claim 7 is drawn to a master disc for an optical disc which is used when the optical disc having concave/convex shapes is manufactured,	
wherein a substrate (1) is coated with an inorganic resist layer (2) in which oxygen concentration is made different in its thickness direction and which is made of an incomplete oxide of a transition metal, and the concave/convex shapes are formed in said inorganic resist layer (2),	Page 10, line 27 through page 11, line 22 Paragraph beginning at page 12, line 20
wherein said oxygen concentration is increased toward the surface of said substrate (1) from the surface of said inorganic resist layer (2).	Paragraph beginning at page 14, line 25

Claim 4 is drawn to a manufacturing method of the master disc for the optical disc according to claim 1, wherein	
a single element or alloy of the transition metal, or an oxide of them is used as a target material,	Paragraph beginning at page 12, line 20
said inorganic resist layer (2) is formed as a film onto the substrate (1) by a sputtering method using oxygen or nitrogen as a reactive gas, and	Paragraph beginning at page 14, line 25
the oxygen concentration of said inorganic resist layer (2) is made different in the thickness direction by changing at least either a film forming power or a reactive gas ratio.	

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The issues presented for consideration in this appeal are as follows:

Whether the Examiner erred in rejecting claims 1, 4-7, and 10 under 35 U.S.C. §103 as allegedly being unpatentable over Japanese Application Publication No. 2003-315998 (Kouchiyama) in view of U.S. Patent No. 4,786,538 (Saito), U.S. Patent No. 4,916,048 (Yamada), and Japanese Application Publication No. 2001-344826 (Lee).

This issue will be discussed hereinbelow.

VII. ARGUMENT

In The Final Office Action of November 4, 2009:

The Examiner erred in rejecting claims 1, 4-7, and 10 under 35 U.S.C. §103 as allegedly being unpatentable over Japanese Application Publication No. 2003-315998 (Kouchiyama) in view of U.S. Patent No. 4,786,538 (Saito), U.S. Patent No. 4,916,048 (Yamada), and Japanese Application Publication No. 2001-344826 (Lee).

For at least the following reasons, Appellant submits that this rejection is both technically and legally unsound and should therefore be reversed.

For purposes of this appeal brief only, and without conceding the teachings of any prior art reference, the claims have been grouped as indicated below.

i. The Examiner erred in rejecting claims 1, 4-7, and 10 under 35 U.S.C. §103 as allegedly being unpatentable over Japanese Application Publication No. 2003-315998 (Kouchiyama) in view of U.S. Patent No. 4,786,538 (Saito), U.S. Patent No. 4,916,048 (Yamada), and Japanese Application Publication No. 2001-344826 (Lee).

A. Claim 1, 6, 7 and 10 stand or fall together.

Claim 6 is dependent upon claim 1. Claim 1 is drawn to a manufacturing method of a master disc for an optical disc, comprising:

a film forming step of forming an inorganic resist layer (2) made of an incomplete oxide of a transition metal as a film onto a substrate (1) {Figure 1A}; and

a step of forming resist patterns including concave/convex shapes by exposing and developing said inorganic resist layer (2) {Figures 1B, 1C},

wherein in said film forming step, oxygen concentration of said inorganic resist layer (2) is made different in its thickness direction,

wherein said oxygen concentration is increased toward the surface of said substrate (1) from the surface of said inorganic resist layer (2).

Claim 10 is dependent upon claim 7. Claim 7 is drawn to a master disc for an optical disc which is used when the optical disc having concave/convex shapes is manufactured,

wherein a substrate (1) is coated with an inorganic resist layer (2) in which oxygen concentration is made different in its thickness direction and which is made of an incomplete oxide of a transition metal, and the concave/convex shapes are formed in said inorganic resist layer (2),

wherein said oxygen concentration is increased toward the surface of said substrate (1) from the surface of said inorganic resist layer (2).

A. Japanese Application Publication No. 2003-315988 (Kouchiyama)

1. Kouchiyama *fails* to disclose, teach, or suggest that *oxygen concentration is increased toward the surface of the substrate from the surface of the inorganic resist layer.*

Page 3 of the Final Office Action *readily admits* that Kouchiyama et al. '988 *does not* teach varying the oxygen concentration so that the concentration near the surface of the substrate *is lower than* the concentration at the surface of the resist.

Thus, the Final Office Action *fails* to show within Kouchiyama the presence of a method or product *wherein the oxygen concentration of said inorganic resist layer is increased toward the surface of the substrate from the surface of the inorganic resist layer.*

B. U.S. Patent No. 4,786,538 (Saito)**1. Saito fails to disclose, teach, or suggest an incomplete oxide of a transition metal.**

Saito arguably teaches that the heat treatment (annealing) applied to the TeOx film formed in accordance with the above-described film forming method is effective to further stabilize the film construction and can be used also in the present invention (Saito at column 3, line 66 to column 3, line 2).

These objects of the present invention are accomplished by an optical recording medium in which by a metal tellurium vapor passing through oxygen gas and/or inert gas formed into a plasma by a high frequency electric power, (a) a tellurium or tellurium suboxide (TeO_x , $0 \leq x < 2$) layer and or (b) a tellurium dioxide (TeO_2) layer are laminated, or (a) a tellurium dioxide (TeO_2), (b) tellurium and/or a tellurium suboxide (TeO_x , $0 \leq x < 2$) and (c) a tellurium dioxide (TeO_2) layers are laminated (Saito at column 2, lines 28-41).

However, the present claims include an incomplete oxide of a transition metal.

While tellurium may quite possibly be a metalloid, the Office Action fails to show tellurium as being a transition metal.

Saito arguably teaches that it is further possible to incorporate a material having a great laser absorptivity such as Sb, Mo, Ge, Se, Bi, In, Sn etc. in the TeOx film (Saito at column 4, lines 7-9).

Nevertheless, Saito fails to disclose, teach, or suggest an incomplete oxide of molybdenum (Mo).

Likewise, Saito **fails** to disclose, teach, or suggest an incomplete oxide of a transition metal.

In this regard, the Office Action **fails** to show that tellurium and a transition metal are one in the same.

Here, a review of any periodic table may reveal tellurium as being something other than a transition metal.

Saito **fails** to disclose, teach, or suggest an inorganic resist layer made of an incomplete oxide of a transition metal.

Thus, Saito **fails** to disclose, teach, or suggest *the oxygen concentration of an inorganic resist layer being increased toward the surface of the substrate from the surface of the inorganic resist layer*.

2. Saito fails to disclose, teach, or suggest forming concave/convex shapes.

Saito **fails** to disclose, teach, or suggest the formation of concave/convex shapes within the TeO_x film.

Thus, Saito **fails** to disclose, teach, or suggest *a step of forming resist patterns including concave/convex shapes by exposing and developing an inorganic resist layer*.

C. U.S. Patent No. 4,916,048 (Yamada)**1. Yamada fails to disclose, teach, or suggest an incomplete oxide of a transition metal.**

Yamada arguably discloses that in the various embodiments of Yamada, the first element is one selected from the group of Te, Sb, Bi, Si, Ge, Sn, Pb, In, Tl, Mo and W (Yamada at column 2, lines 56-58).

However, Yamada fails to disclose, teach, or suggest an incomplete oxide of a transition metal.

The Office Action seems to conclude that the oxygen content in an oxide of tellurium and an oxide of either tungsten or molybdenum would likely produce the same results (Office Action at page 3).

However, this contention appears to be conclusory at best since the Office Action fails to show that tellurium and a transition metal are one in the same.

Instead, a review of any periodic table may reveal tellurium as being something other than a transition metal.

Yamada fails to disclose, teach, or suggest an inorganic resist layer made of an incomplete oxide of a transition metal.

Thus, Yamada fails to disclose, teach, or suggest *the oxygen concentration of an inorganic resist layer being increased toward the surface of the substrate from the surface of the inorganic resist layer*.

2. Yamada fails to disclose, teach, or suggest forming concave/convex shapes.

Yamada fails to disclose, teach, or suggest the formation of concave/convex shapes.

Thus, Yamada fails to disclose, teach, or suggest *a step of forming resist patterns including concave/convex shapes by exposing and developing an inorganic resist layer.*

D. Japanese Application Publication No. 2001-344826 (Lee)

1. Lee fails to disclose, teach, or suggest an incomplete oxide of a transition metal.

Paragraph [0008] in the machine translation of Lee arguably discloses that the laser of different power Pw1 and Pw2 cuts this photoresist 103.

However, Lee fails to disclose, teach, or suggest an incomplete oxide of a transition metal.

Thus, Lee fails to disclose, teach, or suggest *the oxygen concentration of an inorganic resist layer being increased toward the surface of the substrate from the surface of the inorganic resist layer.*

2. Lee fails to disclose, teach, or suggest forming concave/convex shapes.

Lee fails to disclose, teach, or suggest the formation of concave/convex shapes.

Thus, Lee fails to disclose, teach, or suggest *a step of forming resist patterns including concave/convex shapes by exposing and developing an inorganic resist layer.*

E. Combination of Kouchiyama, Saito, Yamada, and Lee.

1. Standards of review.

The Patent and Trademark Office has the burden of showing a prima facie case of obviousness. *In re Bell*, 26 USPQ2d 1529, 1530 (Fed. Cir. 1993).

In this regard, the Patent and Trademark Office determines the scope of claims in patent applications not solely on the basis of the claim language, but upon giving claims their broadest reasonable construction “in light of the specification as it would be interpreted by one of ordinary skill in the art”. *Phillips v. AWH Corp.*, 75 USPQ2d 1321, 1329 (Fed. Cir. 2005).

In reversing the Board of Patent Appeals and Interferences, the U.S. Court of Appeals for the Federal Circuit explained the this doctrine within *In re Suitco Surface Inc.*, 94 USPQ2d 1640, 1644 (Fed. Cir. 2010):

The broadest-construction rubric coupled with the term “comprising” does not give the PTO an unfettered license to interpret claims to embrace anything remotely related to the claimed invention. Rather, claims should always be read in light of the specification and teachings in the underlying patent. See Schriber-Schroth Co. v. Cleveland Trust Co., 311 U.S. 211, 217 [47 USPQ 345] (1940) (“The claims of a patent are always to be read or interpreted in light of its specifications.”).

Here, the Patent and Trademark Office may not, because it may doubt that the invention is patentable, resort to speculation, unfounded assumptions or hindsight reconstruction to supply deficiencies in its factual basis. *In re Warner and Warner*, 154 USPQ 173, 178 (C.C.P.A. 1967).

In determining the propriety of the Patent and Trademark Office case for prima facie obviousness, it is necessary to ascertain whether the prior art teachings would appear to be sufficient

to one of ordinary skill in the art to suggest making the proposed substitution or other modification. *In re Taborsky*, 183 USPQ 50, 55 (CCPA 1974).

The mere fact that the prior art could be so *modified would not* have made the modification obvious unless the prior art suggested the desirability of the modification. *In re Gordon*, 221 USPQ 1125, 1127 (Fed. Cir. 1984).

2. The combination of Kouchiyama, Saito, Yamada, and Lee fails to meet the standard of obviousness.

Page 3 of the Final Office Action readily admits that Kouchiyama et al. '988 does not teach varying the oxygen concentration so that the concentration near the surface of the substrate is lower than the concentration at the surface of the resist.

To account for this deficiency within Kouchiyama, page 3 of the Final Office Action refers to Saito.

In cases involving new chemical compounds, it remains necessary to identify some reason that would have led a chemist to modify a known compound in a particular manner to establish prima facie obviousness of a new claimed compound. *Takeda Chemical Industries Ltd. v. Alphapharm Pty. Ltd.*, 83 USPQ2d 1169, 1174 (Fed. Cir. 2007).

Here, the Final Office Action fails to identify some reason that would have led a chemist to modify the oxide of Kouchiyama with the disclosure of Saito in a particular manner to establish prima facie obviousness of the claims on appeal.

Specifically, whereas Saito arguably teaches that the heat treatment (annealing) applied to the TeO_x film, a review of any periodic table may reveal tellurium as being something other than a transition metal.

In the absence of a transition metal within Saito, the oxygen concentration of an incomplete oxide of a transition metal being increased toward the surface of a substrate is also absent from within Saito.

To account for this deficiency within Saito, page 3 of the Final Office Action refers to Yamada.

For example, page 3 of the Final Office Action asserts that *the teachings of Yamada et al. are used to show that the teaching to vary the oxygen content in a TeO_x film will likely produce the same results in WO_x and MoO_x films.*

In response, no comparison between a TeO_x film and WO_x film is shown within Yamada.

Likewise, Yamada fails to provide a comparison between a TeO_x film and an Mo_x film.

Instead, the paragraph in Yamada beginning at column 4, line 57, provides as follows:

The thin film photosensitive layer 12 is formed on the base 11 by a vacuum deposition or sputtering method. This photosensitive layer 12 comprises a *first element* selected from a group of metals or semimetals, a *second element* of at least one, which is *different from the first element*, selected from the group of Te, Ge, Sn, Al, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Ga, Mo, Rh, Pd, Ag, Cd, In, Ta, W, Pt, Au, Tl, Pb, Si, Sb, Bi, and an oxygen element, wherein at least part of the oxygen element is bonded with the first element to form its oxide, and the ratio x of the total number of atoms of the oxygen element to that of first element, assuming the maximum valence of the first element in a stable oxide state to be n , satisfies the relation of $0 < x < n/2$. In addition, at least part of the second element exists in a non-oxide state. Examples of the first element may include Te, Sb, Bi, Si, Ge, Sn, Pb, In, Tl, Mo and W.

Apparently, the photosensitive layer 12 of Yamada comprises a first element and a second element.

Here, reliance upon Yamada within the Final Office Action *fails* to establish an equivalence between the first and second elements in the photosensitive layer 12 of Yamada and the TeO_x film of Saito.

Furthermore, reliance upon Yamada within the Final Office Action *fails* to establish an equivalence between the first and second elements in the photosensitive layer 12 of Yamada and the films of Kouchiyama.

Saito and Yamada *fail* to disclose, teach, or suggest the formation of concave/convex shapes.

To account for this deficiency within Saito, page 5 of the Final Office Action refers to Lee.

For example, page 5 of the Final Office Action asserts the following:

Lee et al. teaches a disc manufacturing method in which grooves and pits having different depths are formed by changing the power of the laser beam (abstract). See figures 2A-B.

In response, paragraph [0008] of Lee arguably refers to a “*photoresist 103*”.

Paragraph [0026] of Lee arguably refers to a “*photoresist 20*”.

However, Lee *fails* to specify the materials for either the photoresist 103 or the photoresist 20.

As a consequence, the Final Office Action fails to show that the skilled artisan would have referred to Lee for the formation of concave/convex shapes within the films of Saito or Yamada.

B. Claims 4 and 5 stand or fall together.

Claim 4 is drawn to a manufacturing method of the master disc for the optical disc according to claim 1, wherein

a single element or alloy of the transition metal, or an oxide of them is used as a target material,

said inorganic resist layer is formed as a film onto the substrate by a sputtering method using oxygen or nitrogen as a reactive gas, and

the oxygen concentration of said inorganic resist layer is made different in the thickness direction by changing at least either a film forming power or a reactive gas ratio.

1. Arguments incorporated by reference.

For the purpose of brevity, the arguments presented hereinabove with respect to claim 4 are incorporated by reference.

Additional arguments are presented hereinbelow.

2. Japanese Application Publication No. 2003-315998 (Kouchiyama)

Within claim 4, *the oxygen concentration of said inorganic resist layer is made different in the thickness direction by changing at least either a film forming power or a reactive gas ratio.*

Regarding the resist materials of Kouchiyama, paragraph [0042] of that reference arguably provides that:

The above resist materials may be prepared by sputtering in an Ar+O₂ atmosphere with a target containing a predetermined transition metal.

However, Kouchiyama fails to disclose that within a sputtering method, the oxygen concentration of the inorganic resist layer is made different in the thickness direction by changing at least either a film forming power or a reactive gas ratio.

3. U.S. Patent No. 4,786,538 (Saito)

Saito fails to disclose, teach, or suggest the use of a sputtering method to form a film onto the substrate.

Instead, Saito arguably discloses that in the present invention, metal tellurium is vaporized by the ion plating method under the atmosphere of oxygen gas and/or inert gas (which is sometimes generally merely referred to as "gas") (Saito at column 3, lines 6-9).

Here, Saito fails to disclose, teach, or suggest the process parameters of the ion plating method being compatible with a sputtering process.

The Office Action fails to show that the skilled artisan would have substituted the method of Kouchiyama with the ion plating method of Saito.

But even if the Office Action shows that the skilled artisan would have substituted the method of Kouchiyama with the ion plating method of Saito, the combination of Kouchiyama and Saito fails to show a sputtering method wherein *the oxygen concentration of said inorganic resist layer is made different in the thickness direction by changing at least either a film forming power or a reactive gas ratio.*

In this regard, the Office Action fails to show that the process variables within the ion plating method of Saito would have been equally applicable to the method of Kouchiyama.

Thus, Saito fails to disclose that within a sputtering method, *the oxygen concentration of the inorganic resist layer is made different in the thickness direction by changing at least either a film forming power or a reactive gas ratio.*

4. U.S. Patent No. 4,916,048 (Yamada)

Yamada arguably discloses that the thin film photosensitive layer 12 is formed on the base 11 by a vacuum deposition or sputtering method (Yamada at column 4, lines 57-58).

However, Yamada fails to disclose that within the sputtering method, *the oxygen concentration of the inorganic resist layer is made different in the thickness direction by changing at least either a film forming power or a reactive gas ratio.*

5. Japanese Application Publication No. 2001-344826 (Lee)

Lee is silent as to the presence of a sputtering method.

Thus, Lee fails to disclose that within the sputtering method, the oxygen concentration of the inorganic resist layer is made different in the thickness direction by changing at least either a film forming power or a reactive gas ratio.

Conclusion

The claims are considered allowable for the same reasons discussed above, as well as for the additional features they recite.

Reversal of the Examiner's decision is respectfully requested.

Dated: June 2, 2010

Respectfully submitted,

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CLAIMS APPENDIX

1. (Previously presented) A manufacturing method of a master disc for an optical disc, comprising:

a film forming step of forming an inorganic resist layer made of an incomplete oxide of a transition metal as a film onto a substrate; and

a step of forming resist patterns including concave/convex shapes by exposing and developing said inorganic resist layer,

wherein in said film forming step, oxygen concentration of said inorganic resist layer is made different in its thickness direction,

wherein said oxygen concentration is increased toward the surface of said substrate from the surface of said inorganic resist layer.

2-3. (Canceled)

4. (Original) A manufacturing method of the master disc for the optical disc according to claim 1, wherein a single element or alloy of the transition metal, or an oxide of them is used as a target material, said inorganic resist layer is formed as a film onto the substrate by a sputtering method using oxygen or nitrogen as a reactive gas, and the oxygen concentration of said inorganic resist layer is made different in the thickness direction by changing at least either a film forming power or a reactive gas ratio.

5. (Original) A manufacturing method of the master disc for the optical disc according to claim 4, wherein one of tungsten, molybdenum, tungsten molybdenum, and their oxide is used as said target material.

6. (Original) A manufacturing method of the master disc for the optical disc according to claim 1, wherein the concave/convex shapes of different depths are formed by changing an exposing power to said inorganic resist layer.

7. (Previously presented) A master disc for an optical disc which is used when the optical disc having concave/convex shapes is manufactured,

wherein a substrate is coated with an inorganic resist layer in which oxygen concentration is made different in its thickness direction and which is made of an incomplete oxide of a transition metal, and the concave/convex shapes are formed in said inorganic resist layer,

wherein said oxygen concentration is increased toward the surface of said substrate from the surface of said inorganic resist layer.

8-9. (Original)

10. (Original) A master disc for the optical disc according to claim 7, wherein the concave/convex shapes of different depths are formed in said inorganic resist layer.

EVIDENCE APPENDIX

There is no other evidence that will directly affect or have a bearing on the Board's decision in this appeal.

RELATED PROCEEDINGS APPENDIX

There are no other appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.